

**IN THE CLAIMS:**

Please write the claims to read as follows:

Please cancel claims 1-20 without prejudice.

1 1-20. (Canceled)

Please add new claims 21 *et seq.*:

1 21. (New) A method for use in a negotiated graceful takeover in a computer cluster  
2 having a first and second computer, the method comprising the steps of:

3 detecting an operational fault at the first computer;

4 requesting, from the first computer, in response to the operational fault, that the  
5 second computer take over for the first computer;

6 requesting, from the second computer, that the first computer shut down;

7 completing service requests at the first computer pending at the time the first  
8 computer was requested to shut down;

9 transferring responsibilities of the first computer to the second computer; and

10 shutting down the first computer.

1 22. (New) The method as in claim 21, further comprising: monitoring, from the second  
2 computer, for any operational faults at the first computer.

1 23. (New) The method as in claim 21, further comprising: diagnosing, at the first com-  
2 puter, the operational fault of the first computer.

1 24. (New) The method as in claim 21, further comprising: requesting, from the first  
2 computer, that the second computer diagnose the operational fault of the first computer.

1 25. (New) The method as in claim 21, further comprising: diagnosing, at the second  
2 computer, the operational fault of the first computer.

1 26. (New) The method as in claim 21, further comprising: sending, from the first com-  
2 puter to the second computer, an indication of the type of operational fault detected at the  
3 first computer.

1 27. (New) The method as in claim 21, further comprising: determining, at the second  
2 computer, if the second computer can take over for the first computer before requesting  
3 the shut down of the first computer.

1 28. (New) The method as in claim 21, further comprising: refusing further service re-  
2 quests at the first computer after the first computer was requested to shut down.

1 29. (New) The method as in claim 21, further comprising: transferring access of a stor-  
2 age device for the first computer to the second computer.

1 30. (New) The method as in claim 21, further comprising: asserting, at the second com-  
2 puter, disk reservations of disks of the first computer.

1 31. (New) The method as in claim 21, further comprising: rerouting file service requests  
2 from the first computer to the second computer.

1 32. (New) The method as in claim 21, further comprising: activating, at the second  
2 computer, network interfaces and network addresses that replicate those of the first com-  
3 puter.

1 33. (New) The method as in claim 21, further comprising: initiating a countdown timer  
2 subsequent to the shut down request from the second computer.

1 34. (New) The method as in claim 33, further comprising: forcing the first computer to  
2 shut down in the event the first computer is still operating at the expiration of the count-  
3 down timer.

1 35. (New) The method as in claim 21, further comprising: detecting, at the second com-  
2 puter, the shut down of the first computer by the absence of a periodic heartbeat signal.

1 36. (New) The method as in claim 21, further comprising: storing, at the first computer,  
2 state information of the first computer prior to shutting down.

1 37. (New) The method as in claim 21, further comprising: sending periodic requests  
2 from the second computer to the first computer to remain shut down, after the first com-  
3 puter has shut down.

1 38. (New) The method as in claim 21, further comprising: requesting, from the first  
2 computer, that the second computer restore responsibilities of the first computer to the  
3 first computer.

1 39. (New) The method as in claim 21, further comprising: restoring responsibilities of  
2 the first computer to the first computer upon restart of the first computer.

1 40. (New) The method as in claim 21, further comprising: restoring responsibilities of  
2 the first computer to the first computer upon curing the operational fault of the first com-  
3 puter.

1 41. (New) The method as in claim 21, further comprising: using the first and second  
2 computers as a file servers.

1 42. (New) A storage system capable of performing a negotiated graceful takeover, the  
2 storage system comprising:

3 a first computer;

4 a second computer;

5 a first processor for the first computer to

6 i) detect an operational fault at the first computer, and

7 ii) request, in response to the operational fault, that the second computer  
8 take over for the first computer; and

9 a second processor for the second computer to

10 i) request that the first computer shut down,

11 ii) allow the first computer to complete service requests pending at the  
12 time the first computer was requested to shut down,

13 iii) take over any responsibilities of the first computer, and

14                   iv) allow the first computer to shut down.

1    43. (New) The storage system as in claim 42, further comprising: a failover monitor to  
2    monitor for any operational faults at the first computer.

1    44. (New) The storage system as in claim 42, further comprising: the first processor to  
2    diagnose the operational fault of the first computer.

1    45. (New) The storage system as in claim 42, further comprising: the first processor to  
2    request that the second computer diagnose the operational fault of the first computer.

1    46. (New) The storage system as in claim 42, further comprising: the second processor  
2    to diagnose the operational fault of the first computer.

1    47. (New) The storage system as in claim 42, further comprising: the first processor to  
2    send, to the second computer, an indication of the type of operational fault detected at the  
3    first computer.

1    48. (New) The storage system as in claim 42, further comprising: the second processor  
2    to determine if the second computer can take over for the first computer before requesting  
3    the shut down of the first computer.

1    49. (New) The storage system as in claim 42, further comprising: the first processor to  
2    refuse further service requests at the first computer after the first computer was requested  
3    to shut down.

- 1 50. (New) The storage system as in claim 42, further comprising:  
2 a storage device for the first computer; and  
3 an interconnect to transfer access of the storage device for the first computer to  
4 the second computer.
- 1 51. (New) The storage system as in claim 42, further comprising: disks of the first com-  
2 puter, the disks to be reserved by the second computer while the first computer is shut  
3 down.
- 1 52. (New) The storage system as in claim 42, further comprising: an interconnect to re-  
2 route file service requests from the first computer to the second computer.
- 1 53. (New) The storage system as in claim 42, further comprising:  
2 network interfaces at the first computer;  
3 network addresses at the first computer;  
4 network interfaces at the second computer that replicate the network interfaces of  
5 the first computer; and  
6 network addresses at the second computer that replicate the network interfaces of  
7 the first computer, the network interfaces and addresses at the second computer that rep-  
8 licate the network interfaces and addresses of the first computer to be activated by the  
9 second computer while the first computer is shut down.

1 54. (New) The storage system as in claim 42, further comprising: a countdown timer,  
2 the countdown timer to be initiated subsequent to the shut down request from the second  
3 computer.

1 55. (New) The storage system as in claim 54, further comprising: an interconnect to  
2 force the first computer to shut down in the event the first computer is still operating at  
3 the expiration of the countdown timer.

1 56. (New) The storage system as in claim 42, further comprising: an interconnect at the  
2 second computer to detect the shut down of the first computer by the absence of a peri-  
3 odic heartbeat signal.

1 57. (New) The storage system as in claim 42, further comprising: persistent memory at  
2 the first computer to store state information of the first computer prior to shutting down.

1 58. (New) The storage system as in claim 42, further comprising: an interconnect at the  
2 second computer to send periodic requests to the first computer to remain shut down, af-  
3 ter the first computer has shut down.

1 59. (New) The storage system as in claim 42, further comprising: the first processor to  
2 request that the second computer restore responsibilities of the first computer to the first  
3 computer.

1 60. (New) The storage system as in claim 42, further comprising: an interconnect to re-  
2 store responsibilities of the first computer to the first computer upon restart of the first  
3 computer.

1 61. (New) The storage system as in claim 42, further comprising: an interconnect to re-  
2 store responsibilities of the first computer to the first computer upon curing the opera-  
3 tional fault of the first computer.

1 62. (New) The storage system as in claim 42, further comprising: the first and second  
2 computers are file servers.

1 63. (New) A storage system capable of performing a negotiated graceful takeover, the  
2 storage system comprising:  
3 a first computer;  
4 a second computer;  
5 means for detecting an operational fault at the first computer;  
6 means for requesting, from the first computer, in response to the operational fault,  
7 that the second computer take over for the first computer;  
8 means for requesting, from the second computer, that the first computer shut  
9 down;  
10 means for completing service requests at the first computer pending at the time  
11 the first computer was requested to shut down;  
12 means for transferring responsibilities of the first computer to the second com-  
13 puter; and  
14 means for shutting down the first computer.



1 64. (New) A computer readable media, comprising: the computer readable media con-  
2 taining instructions for execution in a processor for the method of,  
3 detecting an operational fault at a first computer;  
4 requesting, from the first computer, in response to the operational fault, that a  
5 second computer take over for the first computer;  
6 requesting, from the second computer, that the first computer shut down;  
7 completing service requests at the first computer pending at the time the first  
8 computer was requested to shut down;  
9 transferring responsibilities of the first computer to the second computer; and  
10 shutting down the first computer.

1 65. (New) Electromagnetic signals propagating on a computer network, comprising: the  
2 electromagnetic signals carrying instructions for execution in a processor for the method  
3 of,  
4 detecting an operational fault at a first computer;  
5 requesting, from the first computer, in response to the operational fault, that a  
6 second computer take over for the first computer;  
7 requesting, from the second computer, that the first computer shut down;  
8 completing service requests at the first computer pending at the time the first  
9 computer was requested to shut down;  
10 transferring responsibilities of the first computer to the second computer; and  
11 shutting down the first computer.

**IN THE DRAWINGS:**

Please replace the informal Figures 1-5 of the Drawing with the formal versions attached herewith. Figure 5 has been amended, and an informal annotated sheet of Figure 5 with the changes marked in red has also been attached.